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Wm. A. Thedford

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Mode-S Transponder MOPS
Working Paper SC209-WP06-TBD
January 29 – February 2, 2007
Melbourne, Florida

RTCA Special Committee SC-209
Transponder MOPS

Meeting #6

Review of the relationship between drafts of DO 181D and ED 73C

Working Paper SC209-WP06-11
AGENDA Item 16

Prepared by: Wm. A. Thedford, AACAS LLC

The attached summary is approximately 1/6th of the entire review. It will be updated to the current document draft versions for the next meeting of EUROCAE WG 49 and subsequently the next RTCA SC209.

Although this is the actual review for these items, it does not represent final results. ***Relationship Query***

Comparable	<i>ID</i>		<i>Doc1_ID</i>		<i>Doc2_ID</i>	
<i>Comment</i>						
shall0005	2.1.1	Airworthiness	shall0012	2.1	AIRWORTHINESS	
The design and manufacture of the equipment shall provide for installation that does not impair the airworthiness of the aircraft.			The equipment shall not, under normal or fault conditions, impair the airworthiness of the aircraft in which it is installed.			
Comparable	<i>ID</i>		<i>Doc1_ID</i>		<i>Doc2_ID</i>	
	4		1		2	

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Comment

shall0008 2.1.3 Federal Communications Commission Rules

The equipment shall comply with all applicable rules of the Federal Communications Commission.

Comparable

ID

5

Doc1_ID

1

Doc2_ID

2

Comment

shall0009 2.1.4 Fire Protection

Except for small parts (such as knobs, fasteners, seals, grommets and small electrical parts) that would not contribute significantly to the propagation of a fire, all materials used shall be self-extinguishing.

Comparable

ID

6

Doc1_ID

1

Doc2_ID

2

Comment

shall0010 2.1.5 Operation of Controls

The operation of controls intended for use during flight, in all possible combinations and sequences, shall not result in a condition detrimental to the continued performance of the equipment (see §2.1.2).

shall0013 2.2 INTERNATIONAL TELECOMMUNICATIONS UNION

The equipment shall comply with the relevant International Telecommunications Union Radio Regulations.

shall0014 2.3 FIRE PROTECTION

Except for small parts (such as knobs, fasteners, seals, grommets and small electrical parts) that would not contribute significantly to the propagation of a fire, all materials used shall be self-extinguishing.

shall0015 2.4 OPERATION OF CONTROLS

The operation of controls intended for use during flight, in all possible positions, combinations and sequences, shall not result in a condition detrimental to the continued performance of the equipment.

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Comparable	ID	8	Doc1_ID	1	Doc2_ID	2
Comment						
shall0011	2.1.6	Accessibility of Controls	shall0016	2.4	OPERATION OF CONTROLS	
Controls that are not normally adjusted in flight shall not be readily accessible to flight personnel.			Controls which are not intended to be operated in flight shall not be readily accessible to flight personnel.			
Comparable	ID	9	Doc1_ID	1	Doc2_ID	2
Comment						
shall0013	2.1.7	Flight Crew Control Functions	shall0020	2.5	CONTROL AND INDICATION FUNCTIONS	
Return to normal operation from this condition shall be possible within five seconds.			Return to normal operation from this condition shall be possible within five seconds.			
Comparable	ID	12	Doc1_ID	1	Doc2_ID	2
Comment						
shall0015	2.1.7	Flight Crew Control Functions	shall0024	2.5	CONTROL AND INDICATION FUNCTIONS	
Return to normal operation from this condition shall be possible within five seconds.			Return to normal operation from this condition shall be possible within five seconds.			
Comparable	ID	77	Doc1_ID	1	Doc2_ID	2
Comment						
shall0016	2.1.7	Flight Crew Control Functions	shall0027	2.5	CONTROL AND INDICATION FUNCTIONS	
If the aircraft uses a flight number for aircraft identification, a means shall be provided for the variable aircraft identification to be inserted by			If the aircraft uses a flight number for aircraft identification, a means shall be provided for the variable aircraft identification to be inserted by the pilot.			
Comparable	ID	78	Doc1_ID	1	Doc2_ID	2
Comment						
shall0017	2.1.9	Effects of Tests	shall0089	2.8	EFFECTS OF TESTS	
Unless otherwise provided, the application of the specified tests shall produce no subsequently discernible condition detrimental to the continued performance of the equipment.			Unless otherwise stated, the design of the equipment shall be such that, during and after the application of the specified tests, no condition exists which would be detrimental to the subsequent performance of the equipment.			

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Comparable	<i>ID</i>	79	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0019	2.2.2.2	Sensitivity Variation With Frequency	shall0095	3.2.2	Sensitivity Variation with Frequency	
The RF input level required to produce 90 percent replies shall not vary by more than 1 dB and shall at no time exceed a level of -69 dBm for standard ATCRBS interrogation signals in the frequency range between 1029.8 and 1030.2 MHz.			The RF input level needed to produce 90% Mode A or Mode C replies shall not vary by more than 1 dB and shall at no time exceed a level of -69 dBm for standard interrogation signals in the frequency range of 1 029.8 to 1 030.2 MHz.			
Comparable	<i>ID</i>	80	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0020	2.2.2.2	Sensitivity Variation With Frequency	shall0096	3.2.2	Sensitivity Variation with Frequency	
The RF input level required to produce 90 percent replies shall not vary by more than 1 dB and shall at no time exceed a level of -69 dBm for standard ATCRBS interrogation signals in the frequency range between 1029.8 and 1030.2 MHz.			The RF input level needed to produce 90% Mode A or Mode C replies shall not vary by more than 1 dB and shall at no time exceed a level of -69 dBm for standard interrogation signals in the frequency range of 1 029.8 to 1 030.2 MHz.			
Comparable	<i>ID</i>	81	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0021	2.2.2.3	Bandwidth	shall0097	3.2.3	Bandwidth	
The standard ATCRBS interrogation signal required to trigger the transponder below 1005 MHz and above 1055 MHz shall be at least 60 dB stronger than that required to trigger the transponder at 1030 MHz with the same reply efficiency.			The level of an interrogation signal needed to trigger the transponder at frequencies below 1 005 MHz and above 1 055 MHz shall be at least 60 dB above the level needed to trigger the transponder at 1 030 MHz with the same reply			
Comparable	<i>ID</i>	82	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0023	2.2.2.4	Sensitivity and Dynamic Range	shall0099	3.2.4	Sensitivity and Dynamic Range	
The MTL for Mode S format (P6 type) interrogations shall be -74 dBm ±3 dB.			The MTL for Mode S (P6 type) interrogations shall be -74 dBm, ±3 dB.			

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Comparable	<i>ID</i>	84	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0024	2.2.2.4	Sensitivity and Dynamic Range	shall0100	3.2.4	Sensitivity and Dynamic Range	
The reply ratio shall be at least 99 percent for all Mode S (P6 type) interrogations between MTL +3 dB and -21 dBm.			The reply ratio shall be at least 99% for all Mode S (P6 type) interrogations at signal levels between MTL+3dB and -21 dBm.			
Comparable	<i>ID</i>	85	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0025	2.2.2.4	Sensitivity and Dynamic Range	shall0101	3.2.4	Sensitivity and Dynamic Range	
The reply ratio shall not be more than 10 percent for interrogations at signal levels below -81 dBm.			The reply ratio shall not be more than 10% for interrogations at signal levels equal to or below -81 dBm.			
Comparable	<i>ID</i>	86	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0026	2.2.2.4	Sensitivity and Dynamic Range	shall0102	3.2.4	Sensitivity and Dynamic Range	
The variation of the MTL between ATCRBS Mode A and Mode C interrogations shall not exceed 1 dB.			The variation of the MTL between Mode A and Mode C interrogations shall not exceed 1 dB.			
Comparable	<i>ID</i>	87	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0027	2.2.2.4	Sensitivity and Dynamic Range	shall0103	3.2.4	Sensitivity and Dynamic Range	
The reply ratio shall be at least 90 percent for ATCRBS and ATCRBS/Mode S All-Call interrogations between MTL and -21 dBm.			The reply ratio shall be at least 90% for Mode A/C and Mode A/C/S All-Call interrogations between MTL + 3 dB and -21 dBm.			
Comparable	<i>ID</i>	88	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0028	2.2.3.1	Reply Transmission Frequency	shall0104	3.3.1	Reply Transmission Frequency	
The carrier frequency of all downlink transmissions from transponders with Mode S capabilities shall be 1090 MHz plus or minus 1 MHz.			The carrier frequency of reply transmissions shall be 1 090 ±1 MHz.			

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Comparable	ID	98	Doc1_ID	1	Doc2_ID	2
Comment						
shall0036	2.2.3.4.2	Mode S Reply Rate Capability	shall0113	3.4.2	Reply Rate Capability - Mode S	
A transponder equipped for only short Mode S downlink formats (DF), shall have the following minimum reply rate capabilities: 50 Mode S replies in any 1-second interval. 18 Mode S replies in a 100-millisecond interval. 8 Mode S replies in a 25-millisecond interval. 4 Mode S replies in a 1.6-millisecond interval.			A transponder equipped for only short Mode S Downlink Formats (DF), shall have the following minimum reply rate capabilities. (1) 50 Mode S replies in any one second interval; (2) 18 Mode S replies in a 100 millisecond interval; (3) 8 Mode S replies in a 25 millisecond interval; (4) 4 Mode S replies in a 1.6 millisecond interval.			
Comparable	ID	99	Doc1_ID	1	Doc2_ID	2
Comment						
shall0037	2.2.3.4.2	Mode S Reply Rate Capability	shall0114	3.4.2	Reply Rate Capability - Mode S	
A transponder equipped for long Mode S reply formats shall be able to transmit as long replies: At least 16 of the 50 Mode S replies in any 1-second interval. At least 6 of the 18 Mode S replies in a 100-millisecond interval. At least 4 of the 8 Mode S replies in a 25-millisecond interval. At least 2 of the 4 Mode S replies in a 1.6-millisecond interval.			A transponder equipped for long Mode S reply formats shall be able to transmit as long replies, (1) at least 16 of the 50 Mode S replies in any one second interval; (2) at least 6 of the 18 Mode S replies in a 100 millisecond interval; (3) at least 4 of the 8 Mode S replies in a 25 millisecond interval; (4) at least 2 of the 4 Mode S replies in a 1.6 millisecond interval.			
Comparable	ID	102	Doc1_ID	1	Doc2_ID	2
Comment						
shall0041	2.2.4.1.1	Framing Pulses	shall0117	3.5.1	Mode A/C Framing Pulses	
The reply function shall use two framing pulses nominally spaced 20.3 microseconds apart.			The reply function shall use two framing pulses nominally spaced 20.3 μs apart.			
Comparable	ID	104	Doc1_ID	1	Doc2_ID	2
Comment						
shall0043	2.2.4.1.3	ATCRBS-SPI	shall0118	3.5.3	Mode A/C Special Position Identification (SPI) Pulse	
In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall be provided at a spacing 4.35 microseconds following the last framing pulse.			In addition to the information pulses, a SPI pulse, which may be used with any of the other information pulses upon request, shall be provided at a spacing 4.35 μs following the last framing pulse of Mode A replies only.			

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Comparable	<i>ID</i>	106	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0045	2.2.4.1.3	ATCRBS-SPI	shall0120	3.5.3	Mode A/C Special Position Identification (SPI) Pulse	
Upon activation of the IDENT switch, the SPI pulse shall be transmitted when replying to ATCRBS Mode A interrogations for a period of 18 ±1.0 seconds.			Upon activation of the IDENT switch, the SPI pulse shall be transmitted when replying to Mode A interrogations for a period of 18 ±1.0 seconds.			
Comparable	<i>ID</i>	109	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0048	2.2.4.1.4	ATCRBS Reply Pulse Shape	shall0121	3.5.4	Mode A/C Reply Pulse Shape	
All reply pulses and SPI pulses shall be 0.45 ±0.10 microsecond duration and have rise times of from 0.05 to 0.1 microsecond and decay times of from 0.05 to 0.2 microsecond. The rise and decay time may be less, providing the sideband radiation is no greater than that which would be produced theoretically by a trapezoidal wave having the stated rise and decay time. The Mode S reply spectrum requirement of §2.2.4.2.3.d is an acceptable specification for meeting ATCRBS minimum rise and fall time requirements.			a. All reply pulses including SPI pulses shall have the following characteristics. Duration: 0.45 ±0.1 µs. Rise Time: Between 0.05 and 0.1 µs. Decay Time: Between 0.05 and 0.2 µs. b. The rise and decay times may be less than as specified in paragraph 1.6.3 a. provided that the sideband radiation is no greater than that which would be produced theoretically by a trapezoidal wave having the stated rise and decay times. c. The reply spectrum specification of paragraph 3.3.2 is an acceptable			
Comparable	<i>ID</i>	110	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0049	2.2.4.1.4	ATCRBS Reply Pulse Shape	shall0122	3.5.4	Mode A/C Reply Pulse Shape	
The pulse amplitude variation of one pulse, with respect to any other pulse in a reply train, shall not exceed 1 dB.			The pulse amplitude variation of one pulse, with respect to any other pulse in a reply train, shall not exceed 1 dB.			
Comparable	<i>ID</i>	111	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0050	2.2.4.1.5	ATCRBS Reply Pulse Spacing Tolerance	shall0123	3.5.5	Mode A/C Reply Pulse Position Tolerance	
The pulse spacing tolerances for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall be ±0.10 microsecond.			The pulse position tolerance for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall be ±0.1 µs.			

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<i>Comment</i>						
shall0051	2.2.4.1.5	ATCRBS Reply Pulse Spacing Tolerance	shall0124	3.5.5	Mode A/C Reply Pulse Position Tolerance	
The pulse spacing tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall be ± 0.10 microsecond.			The pulse position tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall be ± 0.1 μ s.			
Comparable	<i>ID</i>	113	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0052	2.2.4.1.5	ATCRBS Reply Pulse Spacing Tolerance	shall0125	3.5.5	Mode A/C Reply Pulse Position Tolerance	
The pulse spacing tolerance of any pulse in the reply group with respect to any other pulse (except the first framing pulse) shall be no more than ± 0.15 microsecond.			The pulse position tolerance of any pulse in the reply group with respect to any other pulse (except the first framing pulse) shall be ± 0.15 μ s.			
Comparable	<i>ID</i>	114	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0053	2.2.4.1.6	ATCRBS Reply Delay and Jitter	shall0145	3.7.1	Mode A/C Reply Delay and Jitter	
At all RF input levels from MTL to -21 dBm, the time delay between the arrival at the transponder input of the leading edge of P3 and the transmission of the leading edge of the first pulse of the reply shall be 3.0 ± 0.5 microseconds.			At all RF input levels from MTL to -21 dBm, the time delay between the arrival at the transponder input of the leading edge of P3 and the transmission of the leading edge of the first pulse of the reply shall be 3.0 ± 0.5 μ s.			
Comparable	<i>ID</i>	115	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0054	2.2.4.1.6	ATCRBS Reply Delay and Jitter	shall0146	3.7.1	Mode A/C Reply Delay and Jitter	
At all RF input levels from 3 dB above MTL to -21 dBm, the jitter at the leading edge of the first pulse of the reply with respect to P3 shall not exceed ± 0.1 microsecond.			At all RF input levels from MTL+3dB to -21 dBm, the jitter at the leading edge of the first pulse of the reply with respect to P3 shall not exceed 0.1 μ s.			
Comparable	<i>ID</i>	116	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0055	2.2.4.1.6	ATCRBS Reply Delay and Jitter	shall0147	3.7.1	Mode A/C Reply Delay and Jitter	
At all RF input levels from 3 dB above MTL to -21 dBm, the time delay variations between ATCRBS modes shall not exceed 0.2 microsecond.			At all RF input levels from MTL+3dB to -21 dBm, the time delay variations between Modes A and C shall not exceed 0.2 μ s.			

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Comparable	<i>ID</i>	117	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0056	2.2.4.2.1	Mode S Preamble	shall0133	3.6.1	Mode S Reply Preamble	
The preamble shall consist of 4 0.5 ±0.05 microsecond pulses.			The preamble shall consist of four 0.5 ±0.05 μs, pulses.			
Comparable	<i>ID</i>	118	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0057	2.2.4.2.1	Mode S Preamble	shall0134	3.6.1	Mode S Reply Preamble	
The second, third and fourth pulses shall be spaced 1.0, 3.5 and 4.5 microseconds, respectively, from the first transmitted pulse.			The second, third and fourth pulses shall be spaced 1.0, 3.5 and 4.5 μs respectively from the first transmitted pulse.			
Comparable	<i>ID</i>	120	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0058	2.2.4.2.1	Mode S Preamble	shall0135	3.6.1	Mode S Reply Preamble	
The spacing tolerance shall be in accordance with §2.2.4.2.4.			The position tolerance shall be in accordance with paragraph 3.6.5.			
Comparable	<i>ID</i>	121	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0059	2.2.4.2.2	Mode S Data Pulses	shall0136	3.6.2	Mode S Reply Data Pulses	
The block of reply data pulses shall begin 8.0 microseconds after the first transmitted pulse.			The block of reply data pulses shall begin 8.0 μs after the first transmitted pulse.			
Comparable	<i>ID</i>	122	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0060	2.2.4.2.2	Mode S Data Pulses	shall0137	3.6.2	Mode S Reply Data Pulses	
Either 56 or 112 1-microsecond intervals shall be assigned to each transmission.			Either 56 or 112 one microsecond intervals shall be assigned to each transmission.			

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Comparable	<i>ID</i>	123	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0061	2.2.4.2.2	Mode S Data Pulses	shall0138	3.6.2	Mode S Reply Data Pulses	
A pulse with a width of 0.5 ±0.05 microsecond shall be transmitted either in the first or the second half of each interval.			A pulse with a width of 0.5 ±0.05 μs shall be transmitted either in the first or in the second half of each interval.			
Comparable	<i>ID</i>	124	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0062	2.2.4.2.2	Mode S Data Pulses	shall0139	3.6.2	Mode S Reply Data Pulses	
If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall merge and a 1.0 ±0.05 microsecond pulse shall be transmitted.			If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall merge in a 1.0 ±0.05 μs pulse.			
Comparable	<i>ID</i>	125	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
second shall shall0063	2.2.4.2.2	Mode S Data Pulses	shall0139	3.6.2	Mode S Reply Data Pulses	
If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall merge and a 1.0 ±0.05 microsecond pulse shall be transmitted.			If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall merge in a 1.0 ±0.05 μs pulse.			
Comparable	<i>ID</i>	127	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
DO is first half shall0065	2.2.4.2.3	Mode S Reply Pulse Shape	shall0141	3.6.4	Mode S Reply Pulse Shape	
The pulse rise time shall not exceed 0.1 microsecond.			All Mode S reply pulses shall have the following characteristics.Duration: See paragraph 3.6.2 c. Rise time: Between 0.05 and 0.1 μs. Decay time: Between 0.05 and 0.2 μs.			

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Comparable	ID	128	Doc1_ID	1	Doc2_ID	2
<i>Comment</i> DO is second half						
shall0066	2.2.4.2.3	Mode S Reply Pulse Shape	shall0141	3.6.4	Mode S Reply Pulse Shape	
The pulse decay time shall not exceed 0.2 microsecond.			All Mode S reply pulses shall have the following characteristics.Duration: See paragraph 3.6.2 c. Rise time: Between 0.05 and 0.1 μ s. Decay time: Between 0.05 and 0.2 μ s.			
Comparable	ID	92	Doc1_ID	1	Doc2_ID	2
<i>Comment</i> both refer to comprable tables						
shall0067	2.2.4.2.3	Mode S Reply Pulse Shape	shall0105	3.3.2	Transmitter Reply Spectrum	
The spectrum of a reply shall not exceed the following bounds:			The spectrum of the transponder transmitter output shall not exceed the limits shown in Table 3.1 and Figure 3.1.			
Comparable	ID	130	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>						
shall0068	2.2.4.2.4	Mode S Reply Pulse Spacing Tolerance	shall0143	3.6.5	Mode S Reply Pulse Intervals	
Mode S reply pulses shall start at a defined multiple of 0.5 microsecond from the first transmitted pulse.			Mode S reply pulses shall start at a defined multiple of 0.5 μ s from the first transmitted pulse of the preamble.			
Comparable	ID	131	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>						
shall0069	2.2.4.2.4	Mode S Reply Pulse Spacing Tolerance	shall0144	3.6.5	Mode S Reply Pulse Intervals	
The pulse position tolerance shall be ± 0.05 microsecond, measured from the first pulse of the reply.			The pulse position tolerance shall be ± 0.05 μ s, measured from the first transmitted pulse of the preamble.			
Comparable	ID	132	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>						
shall0070	2.2.4.2.5	Mode S Reply Delay and Jitter	shall0148	3.7.2	Mode S Reply Delay and Jitter	
At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall occur 128 ± 0.25 microseconds after the sync phase reversal of the received P6 of a Mode S interrogation.			(1) At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall occur 128 ± 0.25 μ s, after the sync phase reversal of the received P6 of a Mode S interrogation.			

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Comparable	<i>ID</i>	133	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0071	2.2.4.2.5	Mode S Reply Delay and Jitter	shall0149	3.7.2	Mode S Reply Delay and Jitter	
At all RF input levels from MTL to -21 dBm, the jitter of the reply delay shall not exceed ± 0.08 microsecond, peak (99.9 percentile).			(2) At all RF input levels from MTL to -21 dBm, the jitter of the reply delay shall not exceed 0.08 μ s, peak (99.9 percentile).			
Comparable	<i>ID</i>	134	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0072	2.2.4.2.5	Mode S Reply Delay and Jitter	shall0150	3.7.2	Mode S Reply Delay and Jitter	
At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall occur 128 ± 0.5 microseconds after the P4 pulse of the ATCRBS/Mode S All-Call interrogation.			(1) At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall occur 128 ± 0.5 μ s, after the P4 pulse of the Mode A/C/S All Call interrogation.			
Comparable	<i>ID</i>	135	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0073	2.2.4.2.5	Mode S Reply Delay and Jitter	shall0151	3.7.2	Mode S Reply Delay and Jitter	
At all RF input levels from MTL +3 dB to -21 dBm, the jitter of the reply delay shall not exceed ± 0.1 microsecond, peak (99.9 percentile).			(2) At all RF input levels from MTL+3dB to -21 dBm, the jitter of the reply delay shall not exceed 0.1 μ s peak (99.9 percentile).			
Similar	<i>ID</i>	11	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i>						
shall0012	2.1.7	Flight Crew Control Functions	shall0017	2.5	CONTROL AND INDICATION FUNCTIONS	
The following functions shall be provided. a. shall be provided: the ATCRBS 4096 reply codes, and of indicating the code selected.			Means of selecting each of The following Control and Indication functions			
			a. Means of selecting each of the Mode A 4096 Identity reply codes;			
			b. Means of activating the Hijack Mode of the transponder without involvement of the Control Function.			

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Similar	ID	10	Doc1_ID	1	Doc2_ID	2
Comment						
	shall0014	2.1.7 Flight Crew Control Functions		shall0021	2.5	CONTROL AND INDICATION FUNCTIONS
	If performed manually, this condition shall have no effect on the transmission of Extended Squitters (see §2.2.23.1.2) or on the reporting of on-the-ground state (see §2.2.13.1.2.c, and §2.2.18.2.7.b).			If performed manually, this condition shall have no effect on the transmission of extended squitters (If the extended squitter function is implemented in the transponder) (3.21.2.6.2) or on the reporting of on-the-ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b, and 3.20.2.7 c).		
Similar	ID	83	Doc1_ID	1	Doc2_ID	2
Comment						
	shall0022	2.2.2.4 Sensitivity and Dynamic Range		shall0098	3.2.4	Sensitivity and Dynamic Range
	The MTL for ATCRBS and ATCRBS/Mode S All-Call interrogations shall be -73 dBm ±4 dB.			The Minimum Triggering Level (MTL) for Mode A/C and Mode A/C/S All Call interrogations, having equal amplitude P1 and P3 pulses and P2 not detected shall be 73 dBm, ±4 dB.		
Similar	ID	89	Doc1_ID	1	Doc2_ID	2
Comment						
	shall0029	2.2.3.2 RF Peak Output Power		shall0106	3.3.3	RF Peak Output Power
	The RF peak output power of each pulse of each reply at the terminals of the antenna shall be:			The RF peak output power of each pulse of each reply at the terminals of the antenna shall be as follows.		
	a.	CLASS 1 Equipment		minimum RF peak power for equipment intended for installation in		a.
	aircraft that operate at altitudes not exceeding 15,000 feet and that have a normal cruising speed less than 175 knots: 18.5 dBW (70 W).			Minimum RF peak power: 21.0 dBW (125 W).		
	b.	CLASS 2 Equipment		Maximum RF peak power: 27.0 dBW (500 W).		
	aircraft that have a normal cruising speed in excess of 175 knots: 21.0 dBW (125 W).			minimum RF peak power for equipment intended for installation in		b.
	c.	minimum RF peak power for equipment intended for installation in aircraft that operate at altitudes above 15,000 feet: 21.0 dBW (125 W).		Minimum RF peak power: 18.5 dBW (70W).		
	d.	maximum RF peak power for all equipment: 27.0 dBW (500 W).		Maximum RF peak power: 27.0 dBW (500 W).		
Similar	ID	90	Doc1_ID	1	Doc2_ID	2
Comment						
	shall0030	2.2.3.3 Unwanted Output Power		shall0107	3.3.4	Residual Power Output
	When the transponder transmitter is in the inactive state, the RF output power at 1090 ±3 MHz at the terminals of the antenna shall not exceed -50 dBm.			When the transponder transmitter is in the inactive state, the RF output power at 1 090 ±3 MHz, at the terminals of the antenna shall not exceed -50 dBm, except in transponders intended for use with ACAS where it shall not exceed -70 dBm.		

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When the transponder transmitter is in the inactive state, the RF output power at 1 090 ±3 MHz, at the terminals of the antenna shall not exceed -50 dBm, except in transponders intended for use with ACAS where it shall not exceed -70 dBm.

All the reply rates mentioned in this section shall be in addition to any squitter transmissions that the transponder is required to make.

A transponder equipped for ELM downlink operations shall have the capability of transmitting, at least once every one second, in a 25 millisecond interval, 25% more segments than have been announced in the initialisation (i.e. at least 20 long replies for transponders capable of handling the maximum of 16 segments).

The SPI pulse shall only be initiated by an IDENT switch.

The SPI pulse shall only be initiated by an IDENT switch.

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Different	<i>ID</i>	97	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> mix of Mode A/C and Mode S shall0033 2.2.3.4.1 ATCRBS Reply Rate Capability The transponder shall be able to continuously generate at least 500 ATCRBS 15 pulse replies per second.						
shall0112 3.4.2 Reply Rate Capability - Mode S The total reply rate over each time interval specified below, shall be the sum of the individual Mode A/C replies at an average rate of 500 per second and the Mode S reply rate over that interval.						
Different	<i>ID</i>	94	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> shall0034 2.2.3.4.1 ATCRBS Reply Rate Capability If intended for installation in aircraft that operate at altitudes above 15,000 feet, the transponder shall be capable of a peak reply rate of 1,200 ATCRBS 15 pulse replies per second for a duration of 100 milliseconds.						
shall0110 3.4.1 Reply Rate Capability - Mode A/C CLASS 1 equipment shall be capable of at least 1 200 Mode A/C replies per second for a 15 pulse coded reply (including 2 framing pulses, 12 information pulses and the SPI pulse).						
Different	<i>ID</i>	95	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> shall0035 2.2.3.4.1 ATCRBS Reply Rate Capability If intended for installation in aircraft that operate at altitudes not exceeding 15,000 feet, the transponder shall be capable of a peak reply rate of 1,000 ATCRBS 15 pulse replies per second for a duration of 100						
shall0111 3.4.1 Reply Rate Capability - Mode A/C CLASS 2 equipment shall be capable of at least 1 000 Mode A/C replies per second for a 15 pulse coded reply (including 2 framing pulses, 12 information pulses and the SPI pulse).						
Different	<i>ID</i>	108	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> The DO shall says no Mode C SPI and the ED leaves that question open. shall0047 2.2.4.1.3 ATCRBS-SPI The SPI pulse shall not be transmitted when replying to Mode C interrogations.						
shall0120 3.5.3 Mode A/C Special Position Identification (SPI) Pulse Upon activation of the IDENT switch, the SPI pulse shall be transmitted when replying to Mode A interrogations for a period of 18 ±1.0 seconds.						
Uncertain	<i>ID</i>	71	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> did not find comprable requirement in ED shall0006 2.1.2 General Performance The equipment shall perform its intended function as defined by the manufacturer, and its proper use shall not create a hazard to users of the National Airspace System (NAS).						

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Uncertain	<i>ID</i>	72	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> did not find comprable requirement in ED shall0007 2.1.2 General Performance The equipment shall perform its intended function as defined by the manufacturer, and its proper use shall not create a hazard to users of the National Airspace System (NAS).						
No Link	<i>ID</i>	67	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> No comprable text but not a major issue shall0018 2.5 CONTROL AND INDICATION FUNCTIONS All selected Mode A 4096 Codes shall be shown.						
No Link	<i>ID</i>	66	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> No Hijack mode in DO181 shall0019 2.5 CONTROL AND INDICATION FUNCTIONS The 7500 Hijack Code shall NOT be displayed by the Control Function.						
No Link	<i>ID</i>	73	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> Hijack not in DO shall0022 2.5 CONTROL AND INDICATION FUNCTIONS No method shall be capable of rendering the transponder incapable of generating replies to Mode A/C, Mode A/C/S All Call, and Mode-S Only All-Call interrogations whenever the transponder is in the Hijack Mode (2.6) whether in the airborne or in the on-ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c).						
No Link	<i>ID</i>	74	<i>Doc1_ID</i>	1	<i>Doc2_ID</i>	2
<i>Comment</i> Hijack not in DO shall0023 2.5 CONTROL AND INDICATION FUNCTIONS The transponder shall also continue to generate Mode S squitter transmissions and reply to discretely addressed Mode-S interrogations when the aircraft is in the Hijack Mode (2.7).						

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No Link	ID	75	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO					
shall0025 2.5 CONTROL AND INDICATION FUNCTIONS						
No method shall be capable of placing the transponder into the Standby Mode once the transponder has entered the Hijack Mode (2.7) except as specified in						
No Link	ID	76	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO					
shall0026 2.5 CONTROL AND INDICATION FUNCTIONS						
No method shall be capable of placing the transponder in a mode that inhibits the transmission of altitude information when in the Hijack Mode (2.7) and in the airborne state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c) except as specified in 2.7.3.1.1 b.						
No Link	ID	13	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0036 2.7 MODE S TRANSPONDER HIJACK MODE						
When it is supported the requirements in this section shall apply.						
No Link	ID	14	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0037 2.7.2.1 Standard “7500” Code Entry						
and 3.17.1 b (2)) for a minimum period of 10 seconds, transponders shall operate depending upon the intended configuration and the initial state of the unit as						
No Link	ID	15	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0038 2.7.2.1.1 Dual Antenna Systems and Dual Diversity						
Transponder Configuration						
Transponders intended for Dual Antenna Systems and Dual Diversity						
Transponder configuration (see 2.6 a) shall operate as follows:						

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No Link	ID	16	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0039	2.7.2.1.1	Dual Antenna Systems and Dual Diversity Transponder Configuration
				The Active On transponder shall enter the Active Hijack Mode.		
No Link	ID	17	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0040	2.7.2.1.1	Dual Antenna Systems and Dual Diversity Transponder Configuration
				The Standby transponder shall enter the Standby Hijack Mode		
No Link	ID	18	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0041	2.7.2.1.2	Single Antenna System and Dual Diversity Transponder Configuration
				Transponders intended for Single Antenna System and Dual Diversity Transponder configurations (see 2.6 b) shall operate as follows:		
No Link	ID	19	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0042	2.7.2.1.2	Single Antenna System and Dual Diversity Transponder Configuration
				The Active On transponder shall enter the Active Hijack Mode.		
No Link	ID	20	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0043	2.7.2.1.2	Single Antenna System and Dual Diversity Transponder Configuration
				The Standby transponder shall enter the Active Hijack Mode.		

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No Link	ID	21	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0044 2.7.2.2 "7500" Code Entry with SPI						
Upon receipt (or selection) of 4096 Identity Code "7500" (see 2.5 a and 3.17.1 b (2)) and activation of the Special Position Identifier (SPI, Ident.) (see 2.5 f and 3.17.1 b (4)) being coincident in any order, transponders shall operate depending upon the intended configuration and the initial state of the unit as follows						
No Link	ID	22	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0045 2.7.2.2.1 Dual Antenna Systems and Dual Diversity Transponder Configuration						
Transponders intended for Dual Antenna Systems and Dual Diversity Transponder configurations (see 2.6 a) shall operate as follows:						
No Link	ID	23	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0046 2.7.2.2.1 Dual Antenna Systems and Dual Diversity Transponder Configuration						
The Active On transponder shall immediately enter the Active Hijack Mode.						
No Link	ID	24	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0047 2.7.2.2.1 Dual Antenna Systems and Dual Diversity Transponder Configuration						
The Standby transponder shall immediately enter the Standby Hijack Mode						
No Link	ID	25	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0048 2.7.2.2.2 Single Antenna System and Dual Diversity Transponder Configuration						
Transponders intended for Single Antenna System and Dual Diversity Transponder configurations (see 2.6 b) shall operate as follows:						

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No Link	ID	26	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>	Hijack not in DO 181					
				shall0049	2.7.2.2.2	Single Antenna System and Dual Diversity Transponder Configuration
				The Active On transponder shall immediately enter the Active Hijack Mode.		
No Link	ID	27	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>	Hijack not in DO 181					
				shall0050	2.7.2.2.2	Single Antenna System and Dual Diversity Transponder Configuration
				The Standby transponder shall immediately enter the Active Hijack Mode.		
No Link	ID	28	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>	Hijack not in DO 181					
				shall0051	2.7.2.3	Hijack Mode Discrete Initialization.
				The transponder shall provide for a discrete input to allow Hijack mode activation.		
No Link	ID	29	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>	Hijack not in DO 181					
				shall0052	2.7.2.3	Hijack Mode Discrete Initialization.
				De-bounce time necessary to verify that the discrete was properly activated shall NOT exceed 1.0 seconds.		
No Link	ID	30	Doc1_ID	1	Doc2_ID	2
<i>Comment</i>	Hijack not in DO 181					
				shall0053	2.7.2.3	Hijack Mode Discrete Initialization.
				Upon detection of the discrete input, transponders shall operate depending upon the intended configuration and the initial state of the unit as follows:		

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No Link	ID	31	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0054 2.7.2.3.1 Dual Antenna Systems and Dual Diversity Transponder Configuration Transponders intended for Dual Antenna Systems and Dual Diversity Transponder configurations (see 2.6 a) shall operate as follows:						
No Link	ID	32	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0055 2.7.2.3.1 Dual Antenna Systems and Dual Diversity Transponder Configuration The Active On transponder shall immediately enter the Active Hijack Mode.						
No Link	ID	33	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0056 2.7.2.3.1 Dual Antenna Systems and Dual Diversity Transponder Configuration The Standby transponder shall immediately enter the Standby Hijack Mode.						
No Link	ID	34	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0057 2.7.2.3.2 Single Antenna System and Dual Diversity Transponder Configuration Transponders intended for Single Antenna System and Dual Diversity Transponder configurations (see 2.6 b) shall operate as follows:						
No Link	ID	35	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0058 2.7.2.3.2 Single Antenna System and Dual Diversity Transponder Configuration The Active On transponder shall immediately enter the Active Hijack Mode.						

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No Link	ID	36	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0059 2.7.2.3.2 Single Antenna System and Dual Diversity Transponder Configuration The Standby transponder shall immediately enter the Active Hijack Mode.						
No Link	ID	37	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0060 2.7.3.1 General Requirements (Airborne and On-Ground states) Upon entry of the Active Hijack Mode, both an Airborne unit and an On-Ground unit shall :						
No Link	ID	38	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0061 2.7.3.1.1 Altitude Reporting Requirements When in the Active Hijack Mode both an Airborne transponder and an On Ground transponder shall continually provide the transmission of valid altitude information (see 2.5 g (2)) in all replies to interrogations required by 2.5 d and 2.5 g regardless of flight crew or other commands that may attempt to inhibit the reporting of altitude data.						
No Link	ID	39	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0062 2.7.3.1.1 Altitude Reporting Requirements When in the Active Hijack Mode, invalid altitude information shall result in both an Airborne transponder and an On Ground transponder continuing to: (1) Provide Mode C replies with Framing Pulses only (2) Provide Mode S replies with all ZERO's in the altitude field						
No Link	ID	40	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0063 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) When in the Active Hijack mode, the transponder shall continue to support all TCAS operations as required with the following exceptions:						

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No Link	ID	41	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0064	2.7.3.1.2	TCAS Communication Requirements (if TCAS equipped)
				The transponder shall set the Sensitivity Level Control sent to the on-board TCAS to a maximum capability of "TA Only" mode.		
No Link	ID	42	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0065	2.7.3.1.2	TCAS Communication Requirements (if TCAS equipped)
				The following constraints shall apply:		
No Link	ID	43	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0066	2.7.3.1.2	TCAS Communication Requirements (if TCAS equipped)
				If the Sensitivity Level Control (SLC) received by the transponder from its associated Control function is set to indicate a mode that is less than the "TA/RA" mode (i.e., SL = 1 or 2) then the same SLC shall be provided to the on-board		
No Link	ID	44	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0067	2.7.3.1.2	TCAS Communication Requirements (if TCAS equipped)
				If the Sensitivity Level Control received from the Control function is set to TA/RA mode, then it shall be changed to TA Only (i.e., SL = 2) prior to the transponder providing it to the on-board TCAS.		
No Link	ID	45	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
				shall0068	2.7.3.1.2	TCAS Communication Requirements (if TCAS equipped)
				The transponder shall set the 4096 Identity Code sent to the on-board TCAS to the code of "7500" at all times while in the Active Hijack Mode.		

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No Link	ID	46	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0069 2.7.3.2 On-Ground State Only						
The transponder shall continue to operate in accordance with 2.5 d when in the Active Hijack Mode and in the On-Ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c).						
No Link	ID	47	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0070 2.7.3.3 Loss of Control						
Once in the Active Hijack Mode, the transponder shall ensure that it remains in the Active Hijack mode even if all communication is lost with the Control function.						
No Link	ID	48	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0071 2.7.3.3 Loss of Control						
Specifically, the transponder shall NOT enter the Active On, Standby or Standby Hijack modes upon determining that it is no longer receiving control information.						
No Link	ID	49	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0072 2.7.4.1 General Requirements (Airborne and On-Ground states)						
Specifically, the transponder shall NOT be capable of exiting the Standby Hijack Mode and entering the Active Hijack or the Active ON Mode.						
No Link	ID	50	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0073 2.7.4.2 TCAS Communication Requirements (if TCAS equipped)						
When in the Standby Hijack mode, the transponder shall continue to support all TCAS operations as required with the following exceptions:						

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No Link	ID	51	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0074 2.7.4.2 TCAS Communication Requirements (if TCAS equipped)						
The transponder shall set the Sensitivity Level Control sent to the on-board TCAS to a maximum capability of TA Only mode.						
No Link	ID	52	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0075 2.7.4.2 TCAS Communication Requirements (if TCAS equipped)						
The following constraints shall apply:						
No Link	ID	53	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0076 2.7.4.2 TCAS Communication Requirements (if TCAS equipped)						
If the Sensitivity Level Control (SLC) received by the transponder from its associated Control function is set to indicate a mode that is less than the TA/RA mode (i.e., SL = 1 or 2) then the same SLC shall be provided to the on-board						
No Link	ID	54	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0077 2.7.4.2 TCAS Communication Requirements (if TCAS equipped)						
If the Sensitivity Level Control received from the Control function is set to TA/RA mode, then it shall be changed to TA Only (i.e., SL = 2) prior to the transponder providing it to the on-board TCAS.						
No Link	ID	55	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0078 2.7.4.2 TCAS Communication Requirements (if TCAS equipped)						
The transponder shall set the 4096 Identity Code sent to the on-board TCAS to the code of "7500" at all times while in the Standby Hijack Mode.						

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No Link	ID	56	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0079 2.7.4.3 Loss of Control						
Once in the Standby Hijack Mode, the transponder shall ensure that it remains in the Standby Hijack mode even if all communication is lost with the Control						
No Link	ID	57	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0080 2.7.4.3 Loss of Control						
Specifically, the transponder shall NOT enter the Standby, Active On, or Active Hijack modes upon determining that it is no longer receiving control information.						
No Link	ID	58	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0081 2.7.5 Hijack Mode Indication						
A means shall be provided to indicate that the transponder is in the Active Hijack Mode.						
No Link	ID	59	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0082 2.7.5 Hijack Mode Indication						
A means shall be provided to indicate that the transponder is in the Standby Hijack Mode for transponders intended for installation in the Dual Antenna Systems and Dual Diversity Transponder configuration.						
No Link	ID	60	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0083 2.7.5 Hijack Mode Indication						
Momentary power interrupts shall NOT cause the indication described in subparagraph 2.7.5 a.						

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No Link	ID	61	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0084 2.7.5 Hijack Mode Indication						
Momentary power interrupts shall NOT cause the indication described in subparagraph 2.7.5 b.						
No Link	ID	62	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0085 2.7.6.1 Airborne State						
Performance of Hijack Mode Exit Procedures (2.7.6) while in the airborne state shall result in the transponder NOT exiting the Active Hijack Mode nor the Standby Hijack Mode.						
No Link	ID	63	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0086 2.7.6.2 On-Ground State						
While in the On-Ground State, a means shall be provided that shall result in:						
No Link	ID	64	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0087 2.7.6.2 On-Ground State						
While in the On-Ground State, a means shall be provided that shall result in:						
No Link	ID	65	Doc1_ID	1	Doc2_ID	2
Comment	Hijack not in DO 181					
shall0088 2.7.7 Power Interrupt Conditions						
shall provide the capability for the transponder to return to the Active Hijack Mode or Standby Hijack Mode upon restoration of power.						

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No Link ***ID*** 101 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment this ED entry is in a note and corresponds to the note in the DO document following shall0040
shall0116 3.4.3 Mode S ELM Peak Reply Rate
These shall also have a surplus transmitting capacity of 25%.

No Link ***ID*** 126 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment Could not find it in DO

shall0140 3.6.3 Special Position Identification (SPI)
This information shall be present for a period of 18 ±1.0 seconds, after activation.

No Link ***ID*** 7 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment
shall0001 1.4.3.1 Level 1 Transponders
Level 1 Transponders shall have the capabilities prescribed for:

No Link ***ID*** 68 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment Questionable use of Shall - nothing for Level 2
shall0002 1.4.3.3 Level 3 Transponders (Uplink ELM Capability)
Level 3 Transponders shall have the capabilities of §1.4.3.2 and also those prescribed for ground-to-air extended length message (ELM) communications.

No Link ***ID*** 69 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment Questionable use of Shall - nothing for Level 2
shall0003 1.4.3.4 Level 4 Transponders (Full ELM Capability)
Level 4 transponders shall have the capabilities of §1.4.3.3 and also those prescribed for air-to-ground extended length message (ELM) communications.

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No Link ***ID*** 70 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment Questionable use of Shall - nothing for Level 2
shall0004 1.4.3.5 Level 5 Transponders (Enhanced Data Link Protocol
 Capability)
Level 5 transponders shall have the capabilities of §1.4.3.4 and also those
prescribed for enhanced Comm-B and extended length message (ELM)
communications.

No Link ***ID*** 96 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment
shall0033 2.2.3.4.1 ATCRBS Reply Rate Capability

The transponder shall be able to continuously generate at least 500
ATCRBS 15 pulse replies per second.

No Link ***ID*** 103 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment corresponds to ED 3.5.2 which does not have a shall
shall0042 2.2.4.1.2 Information Pulses

The designators of the information pulses and their positions from the first
framing pulse shall be:

No Link ***ID*** 129 ***Doc1_ID*** 1 ***Doc2_ID*** 2

Comment did not find ED reference
shall0064 2.2.4.2.3 Mode S Reply Pulse Shape shall0142 3.6.4 Mode S Reply Pulse Shape

The pulse amplitude variation between one pulse and any other pulse in a
reply shall not exceed 2 dB. The pulse amplitude variation between one pulse and any other pulse in a reply
shall not exceed 2 dB.

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